

Numerical Optimization Studies of the NDCX Induction Accelerator

ENRIQUE HENESTROZA, SONIA IBARRA, LBNL

The Heavy Ion Fusion Science Virtual National Laboratory is designing the Neutralized Drift Compression Experiment (NDCX) at the Lawrence Berkeley National Laboratory. NDCX will help develop novel, still unexplored beam manipulation techniques in order to establish the physics limits on compression of heavy ion beams for creating high energy density matter and fusion ignition conditions. The NDCX components include an injector that delivers a lithium ion beam, and an accelerator that boosts the energy to 2.8 MeV. Further beam manipulations will compress the beam to a final spot radius of less than 1 mm and a pulse length of 1 ns. In order to reach those final parameters, it is required to extract a high brightness beam and minimize the transverse and longitudinal emittance growth along the accelerator. We will present numerical optimization studies of the injector, which is based on the Accel-Decel concept, and the accelerator, which is based on acceleration by induction gaps.

This Research was supported by the U.S. Department of Energy under Contract No. DE-AC02-05CH11231.